

IN THE CLAIMS

All pending claims are reproduced below.

1 1. (Original) A computer-implemented method of automated software
2 specification, comprising:

7 determining and displaying, in response to a user command, multiple
8 specification diagrams, each of which captures the relation between two or more
9 specification modules, along with its specification morphisms;

10 building and displaying, in response to a user command, a diagram of the
11 specification diagrams, the diagram of specification diagrams retaining the diagram
12 morphisms of the specification diagrams; and

13 computing the colimits of the hereditary diagram of diagrams to compose
14 large software modules while preserving the decomposition of the involved components.

1 2. (Original) A computer-implemented method for determining a colimit of a
2 hereditary diagram, comprising:

3 extracting the shape colimit of the hereditary diagram stored in a
4 memory, the hereditary diagram including a plurality of diagrams;

5 bringing each of the plurality of diagrams in the hereditary diagram to
6 the shape of the shape colimit to yield a plurality of extended diagrams in the memory;
7 and

8 taking the colimit of the extended diagrams.

1 3. (Original) The method of claim 2, further comprising: receiving from the user
2 an indication to find the colimit of the hereditary diagram.

1 4. (Original) The method of claim 2, wherein extracting the shape colimit of the
2 hereditary diagram includes:

3 determining the shape of each of the plurality of diagrams to yield a shape
4 graph in the memory; and
5 automatically calculating a colimit of the shape diagram.

1 5. (Original) The method of claim 2, further comprising: displaying a
2 representation of the colimit on a display device.

1 6. (Original) The method of claim 5, wherein the representation of the colimit is
2 the name of the colimit.

1 7. (Original) The method of claim 5, wherein the representation of the colimit is
2 a picture of the diagram of the colimit.

1 8. (Original) The method of claim 2, wherein the hereditary diagram includes
2 types of the diagram elements.

1 9. (Original) The method of claim 2, wherein the hereditary diagram includes
2 morphisms between the diagram elements.

1 10. (Original) The method of claim 2, wherein the hereditary diagram is
2 displayed with indicators on its arcs indicating what morphism is associated with the arcs.

1 11. (Previously Amended) The method of claim 2, wherein the colimit of the
2 hereditary diagram is displayed with indicators on its arcs indicating that arcs constitute a
3 cocone colimit.

1 12. (Original) A computer-implemented system of automated software
2 specification, comprising:

3 specification modules stored as separate entities, with their relations
4 displayed on a computer screen in terms of their specification morphisms, where the
5 specification morphisms translate the specification signatures while preserving the logical
6 structure of the specification;

7 a portion that determines and displays, in response to a user command,
8 multiple specification diagrams, each of which captures the relation between two or more
9 specification modules, along with its specification morphisms;

10 a portion that builds and displays, in response to a user command, a
11 diagram of the specification diagrams, the diagram of specification diagrams retaining the
12 diagram morphisms of the specification diagrams; and

13 a portion that computes the colimits of the hereditary diagram of diagrams
14 to compose large software modules while preserving the decomposition of the involved
15 components.

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